

REMEDIAL DESIGN

AMENDED STATEMENT OF WORK #1

OPERABLE UNIT 1

**NEW CASSEL/HICKSVILLE GROUNDWATER CONTAMINATION SUPERFUND
SITE**

Town of Hempstead, Nassau County, State of New York

EPA Region 2

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1. INTRODUCTION

- 1.1** The Statement of Work (SOW) for Remedial Design, which was attached as Appendix 1 to Unilateral Administrative Order for Remedial Design, Index No. CERCLA-02-2018-2015 (the “Order”), is superseded by this amended SOW, referred to herein as the “Amended SOW #1”. This amendment was necessitated by the refusal of the Western Plume Group Respondents, as defined in the Order, to comply with the Order, which in turn has resulted in EPA electing to fund and perform a portion of the Work under the original SOW, as well as to reorganize certain other tasks required under the original SOW. If one or more of the Western Plume Group Respondents should choose to come into compliance with the Order in the future, the Work set forth in this Amended SOW #1 will likely be revised based on the circumstances at that juncture, such as the Work remaining to be performed. The necessity to amend the original SOW, and the existence of the Amended SOW #1, in no way relieves the Western Plume Group Respondents of their obligations under the Order, including the requirement to perform certain activities under the original SOW attached thereto and this Amended SOW #1. EPA reserves its right to seek, inter alia, to compel compliance with the Order and/or seek penalties or damages under CERCLA.
- 1.2 Purpose of the Amended SOW #1.** This Amended SOW #1 sets forth the procedures and requirements for implementing the Work.
- 1.3 Structure of the Amended SOW #1.**
- Section 2 (Community Involvement) sets forth EPA’s and Respondents’ responsibilities for community involvement.
 - Section 3 (Remedial Design) sets forth the process for developing the RD, which includes the submission of specified primary deliverables.
 - Section 4 (Reporting) sets forth Respondents’ reporting obligations.
 - Section 5 (Deliverables) describes the content of the supporting deliverables and the general requirements regarding Respondents’ submission of, and EPA’s review of, approval of, comment on, and/or modification of, the deliverables.
 - Section 6 (Schedules) sets forth the schedule for submitting the primary deliverables, specifies the supporting deliverables that must accompany each primary deliverable, and sets forth the schedule of milestones regarding the completion of the RD.
 - Section 7 (State Participation) addresses State participation.
 - Section 8 (References) provides a list of references, including URLs.
- 1.4** The Scope of the Remedy includes the actions described in Section 12 of the ROD, including the following:
- A combination of (a) in-situ treatment of groundwater via in-well vapor stripping and (b) extraction of groundwater via pumping and ex-situ treatment of extracted groundwater prior to discharge to a publicly owned treatment works or reinjection to groundwater (to be determined during design). The purpose is to establish containment and effectuate removal of contaminant mass where concentrations of

total volatile organic compound (VOC) concentrations are greater than 100 micrograms per liter ($\mu\text{g/L}$);

- In-situ chemical treatment, such as in-situ chemical oxidation, to target high concentration contaminant areas, as appropriate;
 - Implementation of long-term monitoring to track and monitor changes in groundwater contamination in OU1 to ensure the remedial action objectives are attained;
 - Development of a Site Management Plan to ensure proper management of the remedy post-construction. The Site Management Plan will include provisions for any operation and maintenance and long-term monitoring required for the remedy, as well as periodic certifications; and
 - Institutional controls consisting of any existing local requirements that prevent installation of drinking water wells, and informational devices to limit exposure to contaminated groundwater.
- 1.5 The terms used in this Amended SOW #1 that are defined in CERCLA, in regulations promulgated under CERCLA, or in the Order, have the meanings assigned to them in CERCLA, in such regulations, or in the Order, except that the term "Paragraph" means a paragraph of the Amended SOW #1, and the term "Section" means a section of the Amended SOW #1, unless otherwise stated.

2. COMMUNITY INVOLVEMENT

2.1 Community Involvement Responsibilities

- (a) EPA has the lead responsibility for developing and implementing community involvement activities at the Site. To the extent requested by EPA, Respondents shall provide information relating to the Work for EPA's use in developing and implementing a Community Involvement Plan.
- (b) If requested by EPA, Respondents shall participate in community involvement activities, including participation in (1) the preparation of information regarding the Work for dissemination to the public, with consideration given to including mass media and/or Internet notification, and (2) public meetings that may be held or sponsored by EPA to explain activities at or relating to the Site. Respondents' support of EPA's community involvement activities may include providing online access to initial submissions and updates of deliverables to (1) any Community Advisory Groups, (2) any Technical Assistance Grant recipients and their advisors, and (3) other entities to provide them with a reasonable opportunity for review and comment. EPA may describe in its CIP Respondents' responsibilities for community involvement activities. All community involvement activities conducted by Respondents at EPA's request are subject to EPA's oversight. Upon EPA's request, Respondents shall establish a community information repository at or near the Site to house one copy of the administrative record.

- (c) **Respondents' CI Coordinator.** If requested by EPA, Respondents shall, within 15 days, designate and notify EPA of Respondents' Community Involvement Coordinator (Respondents' CI Coordinator). Respondents may hire a contractor for this purpose. Respondents' notice must include the name, title, and qualifications of the Respondents' CI Coordinator. Respondents' CI Coordinator is responsible for providing support regarding EPA's community involvement activities, including coordinating with EPA's CI Coordinator regarding responses to the public's inquiries about the Site.

3. REMEDIAL DESIGN

3.1 Pre-Design Investigation. The purpose of the Pre-Design Investigation (PDI) is to address data gaps by conducting additional field investigations. Certain PDI activities, as set forth below, shall be conducted by Respondents to gather sufficient information necessary to develop the RD fully for OU1 at the Site.

- (a) Respondents shall submit the following supporting deliverables described in Paragraph 5.7 (Supporting Deliverables): Health and Safety Plan, Field Sampling Plan, Quality Assurance Project Plan, Transportation and Off-site Disposal Plan, and Quality of Life Plan.

- (b) **PDI Work Plan.** Relevant Respondents shall conduct activities provided in the PDI Work Plan (PDIWP), attached as Attachment 1 to this Amended SOW #1. The PDI activities include the following PDI Directives:

- (1) PDI Directive 1: Synoptic Water Level Gauging and Groundwater Sampling

- (i) Round 1 of PDI Directive 1

- (A) In accordance with PDI Directive 1, as this term is defined in the PDIWP, Eastern Plume Group Respondents, as this term is defined in the Order, shall conduct groundwater level gauging and groundwater monitoring well purging, sampling, and analysis at the following monitoring well locations, as provided on Figure 3 of Attachment 1 to the Amended SOW #1 (the PDIWP): FSMW-14A, FSMW-14B, FSMW-14C, FSMW-13A, FSMW-13B, FSMW-13C, MW-14, EX-1, MW-17S, and MW-17D. If the Western Plume Group Respondents, as this term is defined in the Order, fail to comply with the Order, then EPA will perform this work in lieu of the Eastern Plume Group Respondents.

- (B) In accordance with PDI Directive 1, Central Plume Group Respondents, as this term is defined in the Order, shall conduct groundwater level gauging and groundwater monitoring well purging, sampling, and analysis at the

following monitoring well locations, as provided on Figure 3 of Attachment 1 to the Amended SOW #1: MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6. If the Western Plume Group Respondents fail to comply with the Order, then EPA will perform this work in lieu of the Central Plume Group Respondents.

(C) In accordance with PDI Directive 1, Western Plume Group Respondents shall conduct groundwater level gauging and groundwater monitoring well purging, sampling, and analysis at the following monitoring well locations, as provided on Figure 3 of Attachment 1 to the Amended SOW #1: EX-2, MW-7, MW-8, MW-11S, MW-11D, MW-12, and MW-13. If the Western Plume Group Respondents fail to comply with the Order, then EPA will perform this work.

(D) Following completion of PDI Directive 1, Respondents shall collectively submit a PDI Directive 1 Technical Memorandum providing all of the results from the first round of data collected pursuant to PDI Directive 1. If the Western Plume Group Respondents fail to comply with the Order, then EPA will perform this work in lieu of all Respondents. This PDI Directive 1 Technical Memorandum will include:

- A summary of the investigations performed;
- A summary of investigation results;
- A summary of validated data (i.e., tables and graphics);
- Data validation reports and laboratory data reports;
- A narrative interpretation of data and results;
- Results of statistical and modeling analyses, as necessary;
- Photographs documenting the work conducted; and

(ii) Round 2 of PDI Directive 1

(A) Subsequent to the installation of additional monitoring wells pursuant to PDI Directive 2, as defined in the

PDIWP, and as outlined in 3.1.b(2) below, Respondents shall perform a second round of sampling in accordance with PDI Directive 1 to include the additional monitoring wells installed as per PDI Directive 2, as described below in subparagraphs 3.1.b.(1)(ii)(B). If the Western Plume Group Respondents fail to comply with the Order, then EPA will perform this work in lieu of all Respondents.

(B) In accordance with PDI Directive 1, Eastern Plume Group Respondents shall conduct groundwater level gauging and groundwater monitoring well purging, sampling, and analysis at the following monitoring well locations, as provided on Figure 3 of Attachment 1 to this Amended SOW #1: FSMW-14A, FSMW-14B, FSMW-14C, FSMW-13A, FSMW-13B, FSMW-13C, MW-14, EX-1, MW-17S, MW-17D, MW-38, MW-40, MW-41, MW-42, MW-43, MW-44, and MW-45. If MW-37 and MW-39 are installed, Eastern Plume Group Respondents shall conduct groundwater level gauging and groundwater monitoring well purging, sampling, and analysis at these locations. If the Western Plume Group Respondents fail to comply with the Order, then EPA will perform this work in lieu of the Eastern Plume Group Respondents.

(C) In accordance with PDI Directive 1, Central Plume Group Respondents shall conduct groundwater level gauging and groundwater monitoring well purging, sampling, and analysis at the following monitoring well locations, as provided on Figure 3 of Attachment 1 to this OU1 PDI SOW: MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-29, MW-30, MW-32, MW-34, MW-35, and MW-36. If MW-31 and MW-33 are installed, Central Plume Group Respondents shall conduct groundwater level gauging and groundwater monitoring well purging, sampling, and analysis at these locations. If the Western Plume Group Respondents fail to comply with the Order, then EPA will perform this work in lieu of the Central Plume Group Respondents.

(D) In accordance with PDI Directive 1, Western Plume Group Respondents shall conduct groundwater level gauging and groundwater monitoring well purging, sampling, and analysis at the following monitoring well locations, as provided on Figure 3 of Attachment 1 to this OU1 PDI SOW: EX-2, MW-7, MW-8, MW-11S, MW-11D, MW-12, MW-13, MW-20, MW-22, MW-23, MW-26, MW-27, and MW-28. If MW-19, MW-21, MW-24, and MW-25 are

installed, Western Plume Group Respondents shall conduct groundwater level gauging and groundwater monitoring well purging, sampling, and analysis at these locations. If the Western Plume Group Respondents fail to comply with the Order, then EPA will perform this work.

- (E) Following completion of Round 2 sampling as per PDI Directive 1, Respondents shall collectively submit an addendum to the PDI Directive 1 Technical Memorandum providing all of the results of the PDI Directive 1 - Round 2 sampling event. This PDI Directive 1 Technical Memorandum Addendum must include the information identified in 3.1.b(1)(i)(D), above. If the Western Plume Group Respondents fail to comply with the Order, then EPA will perform this work in lieu of all Respondents.

(2) PDI Directive 2: VOC Concentration Groundwater Profiling and Monitoring Well Installation

- (i) In accordance with PDI Directive 2, Eastern Plume Group Respondents shall conduct VOC concentration profiling at the following locations, as provided on Figure 3 of Attachment 1 of this Amended SOW #1: PDI-38, PDI-41, and PDI-44. Following the VOC concentration profiling, Eastern Plume Group Respondents shall install groundwater monitoring wells at the following locations, as provided on Figure 3 of Attachment 1 of this Amended SOW #1: MW-38, MW-40, MW-41, MW-42, MW-43, MW-44, and MW-45. Following the VOC concentration profiling results, a determination will be made as to whether installation of MW-37 and MW-39 is necessary to obtain design parameters.
- (ii) In accordance with PDI Directive 2, Central Plume Group Respondents shall conduct VOC concentration profiling at the following locations, as provided in Figure 3 of Attachment 1 to this Amended SOW #1: PDI-30, PDI-32, and PDI-35. Following the VOC concentration profiling, Central Plume Group Respondents shall install groundwater monitoring wells at the following locations, as provided on Figure 3 of Attachment 1 to this Amended SOW #1: MW-29, MW-30, MW-32, MW-34, MW-35, and MW-36. Following the VOC concentration profiling results, a determination will be made as to whether installation of MW-31 and MW-33 is necessary to obtain design parameters.
- (iii) In accordance with PDI Directive 2, Western Plume Group Respondents shall conduct VOC concentration profiling at the following locations, as provided in Figure 3 of Attachment 1 of

this Amended SOW #1: PDI-20, PDI-22, PDI-23, PDI-27, and PDI-28. Following the VOC concentration profiling, the Western Plume Respondents shall install groundwater monitoring wells at the following locations, as provided on Figure 3 of Attachment 1 to this Amended SOW #1: MW-20, MW-22, MW-23, MW-26, MW-27, and MW-28. Following the VOC concentration profiling results, a determination will be made as to whether installation of MW-19, MW-21, MW-24, and MW-25 is necessary to obtain design parameters. If the Western Plume Group Respondents fail to comply with the Order, then EPA will perform this work.

(iv) Following completion of PDI Directive 2, Respondents shall collectively submit a PDI Directive 2 Technical Memorandum providing all of the results of PDI Directive 2. The PDI Directive 2 Technical Memorandum shall include the information identified in 3.1.b(1)(i)(D), above. If the Western Plume Group Respondents fail to comply with the Order, then the Eastern and Central Plume Group Respondents shall submit a combined PDI Directive 2 Technical Memorandum providing all of the results of PDI Directive 2 from the Eastern and Central Plumes. EPA will then use this memorandum to develop a PDI Directive 2 Technical Memorandum for OU1.

(v) Following Respondents' submission of the PDI Directive 2 Technical Memorandum, Respondents shall collectively submit a PDI Recommendations Report which shall include recommendations identifying which of the remaining PDI Directives 3, 4, and/or 5 shall be implemented. Any request in the PDI Recommendations Report for deviations from the PDI Work Plan shall be accompanied by a schedule which is consistent with Table 1. The PDI Recommendations Report shall include a preliminary designation of the responsibility (i.e., Respondent Group) for each activity presented. Following Respondents' submission of the PDI Recommendations Report, Respondents shall present in-person to EPA at Region 2's New York City office the results of PDI Directives 1 and 2 and Respondents' recommendations for implementing the remaining PDI Directives 3, 4, and/or 5. EPA will notify Relevant Respondents as to which PDI Directive(s) (3, 4, and/or 5) shall be implemented by each respective Respondent Group. If the Western Plume Group fails to comply with the Order, the Eastern and Central Plume Group Respondents shall submit a PDI Recommendations Report covering the Eastern and Central Plumes and they shall present in-person at EPA Region 2 their recommendations for implementing the remaining PDI Directives 3, 4, and/or 5. EPA will thereafter make the above-described notification..

- (vi) Following the submittal of the PDI Recommendations Report and the in-person meeting with EPA as per 3.1.b(2)(v), EPA will identify and notify the Relevant Respondents responsible for the activities related to PDI Directives 3, 4, or 5, referred to below.
- (3) PDI Directive 3: Groundwater Extraction Well Installation and/or Aquifer Testing and Groundwater Extraction Effluent System Evaluation
- (i) Relevant Respondents, as determined by EPA in its notification pursuant to 3.1.b(2)(vi) above, shall conduct work pursuant to PDI Directive 3 and shall notify EPA as to which aquifer testing and effluent discharge evaluation option set forth in the PDIWP they will elect to use.
 - (ii) Following completion of PDI Directive 3, Relevant Respondents shall collectively submit a PDI Directive 3 Technical Memorandum providing all of the results obtained during the performance of PDI Directive 3. The PDI Directive 3 Technical Memorandum shall include the information identified in 3.1.b(1)(i)(D), above.
 - (iii) If a Respondent Group(s) does not initially perform PDI Directive 3 in accordance with 3.1.b(3)(i) above, and if at any time EPA determines that such Respondent Group(s) shall perform PDI Directive 3 or if such Respondent Group(s) recommends a change in approach, then said Respondent Group(s) shall, after EPA approval of the recommendation, submit a PDI Directive 3 Work Plan Amendment to EPA in accordance with applicable guidelines and consistent with the procedures, methodology, and protocol contained in the PDIWP.
 - (iv) If, in accordance with 3.1.b(3)(iii), above, said Respondent Group(s) performs PDI Directive 3 and such performance is subsequent to the submission of the PDI Directive 3 Technical Memorandum required in 3.1.b(3)(ii), then such Respondent Group(s) shall submit a PDI Directive 3 Technical Memorandum Addendum that shall include the information identified in 3.1.b(1)(i)(D), above.
- (4) PDI Directive 4: In-well Vapor Stripping Pilot System Installation and Testing
- (i) Relevant Respondents, as determined by EPA in its notification pursuant to 3.1.b(2)(vi) above, shall conduct work pursuant to PDI Directive 4.
 - (ii) Following completion of PDI Directive 4, Relevant Respondents shall collectively submit a PDI Directive 4 Technical

Memorandum providing all of the results obtained during the performance of PDI Directive 4. The PDI Directive 4 Technical Memorandum shall include the information identified in 3.1.b(1)(i)(D), above.

- (iii) If a Respondent Group(s) does not initially perform PDI Directive 4 in accordance with 3.1.b(4)(i) above, and if at any time EPA determines that such Respondent Group(s) shall perform PDI Directive 4 or if such Respondent Group(s) recommends a change in approach, then said Respondent Group(s) shall, after EPA approval of the recommendation, submit a PDI Directive 4 Work Plan Amendment to EPA in accordance with applicable guidelines and consistent with the procedures, methodology, and protocol contained in the PDIWP.
 - (iv) If, in accordance with 3.1.b(4)(iii) above, said Respondent Group(s) performs PDI Directive 4 and such performance is subsequent to the submission of the PDI Directive 4 Technical Memorandum required in 3.1.b(4)(ii) then such Respondent Group(s) shall submit a PDI Directive 4 Technical Memorandum Addendum that shall include the information identified in 3.1.b(1)(i)(D), above.
- (5) PDI Directive 5: In-Situ Chemical Treatment Pilot System Installation and Testing
- (i) Relevant Respondents, as determined by EPA in its notification pursuant to 3.1.b(2)(vi) above, shall conduct work pursuant to PDI Directive 5.
 - (ii) Following completion of PDI Directive 5, Relevant Respondents shall collectively submit a PDI Directive 5 Technical Memorandum providing all of the results obtained during the performance of PDI Directive 5. The PDI Directive 5 Technical Memorandum shall include the information identified in 3.1.b(1)(i)(D), above.
 - (iii) If a Respondent Group(s) does not initially perform PDI Directive 5 in accordance with 3.1.b(5)(i) above, and if at any time EPA determines that such Respondent Group(s) shall perform PDI Directive 5 or if such Respondent Group(s) recommends a change in approach, then said Respondent Group(s) shall, after EPA approval of the recommendation, submit a PDI Directive 5 Work Plan Amendment to EPA in accordance with applicable guidelines and consistent with the procedures, methodology, and protocol contained in the PDIWP.

- (iv) If, in accordance with 3.1.b(5)(iii) above, said Respondent Group(s) performs PDI Directive 5 and such performance is subsequent to the submission of the PDI Directive 5 Technical Memorandum required in 3.1.b(5)(ii), then such Respondent Group(s) shall submit a PDI Directive 5 Technical Memorandum Addendum that shall include the information identified in 3.1.b(1)(i)(D), above.
- (6) Following Respondents' submission of the latter of the PDI Directive 3 Technical Memorandum, the PDI Directive 4 Technical Memorandum, the PDI Directive 5 Technical Memorandum, and/or any relevant Addenda, or unless otherwise directed by EPA, Respondents' shall collectively submit for EPA approval an RD Recommendations Report which shall include the Respondent's RD Recommendations. The RD Recommendations Report shall include a preliminary designation of the responsibility (i.e., Respondent Group) for each activity presented. Following Respondents' submission of the RD Recommendations Report, Respondents shall present in-person to EPA at Region 2's New York City office the results of PDI Directives 3, 4, and/or 5, and Respondents' RD Recommendations. If the Western Plume Group fails to comply with the Order, the Eastern and Central Plume Group Respondents shall collectively submit the RD Recommendations Report covering the Eastern and Central Plumes and present in person at EPA their RD Recommendations. The RD Recommendations Report must include:
 - (i) Summary of the investigations performed;
 - (ii) Summary of investigation results;
 - (iii) Summary of validated data (i.e., tables and graphics);
 - (iv) Data validation reports and laboratory data reports;
 - (v) Narrative interpretation of data and results;
 - (vi) Results of statistical and modeling analyses;
 - (vii) Photographs documenting the work conducted; and
 - (viii) Conclusions and recommendations for RD, including design parameters and criteria.
- (7) EPA may require Respondents to supplement the PDI Technical Memorandum Report(s) and/or perform additional pre-design studies.
- (8) Following the submittal of the RD Recommendations Report and the in-person meeting with EPA as per 3.1.b(6), EPA will identify and notify the

Relevant Respondents responsible for the activities related to Sections 3.2 through 3.8, below.

3.2 RD Work Plan. Respondents shall submit a Remedial Design (RD) Work Plan (RDWP) for EPA approval. The RDWP must include:

- (a) Plans for implementing all RD activities identified in this Amended SOW #1, in the RDWP, or required by EPA to be conducted to develop the RD;
- (b) A description of the overall management strategy for performing the RD, including a proposal for phasing of design and construction, if applicable;
- (c) A description of the proposed general approach to contracting, construction, operation, maintenance, and monitoring of the Remedial Action (RA) as necessary to implement the Work;
- (d) A description of the responsibility and authority of all organizations and key personnel involved with the development of the RD;
- (e) Descriptions of any areas requiring clarification and/or anticipated problems (e.g., data gaps);
- (f) Description of the pre-design investigation;
- (g) Description of any proposed treatability study;
- (h) Descriptions of any applicable permitting requirements and other regulatory requirements;
- (i) Description of plans for obtaining access in connection with the RA such as property acquisition, property leases, and/or easements; and
- (j) Updates, as required, to the following supporting deliverables described in Paragraph 5.7 (Supporting Deliverables): Health and Safety Plan, Field Sampling Plan, Quality Assurance Project Plan and Emergency Response Plan, Transportation and Off-site Disposal Plan, and Quality of Life Plan.

3.3 Respondents shall meet regularly with EPA to discuss design issues as necessary, as directed or determined by EPA.

3.4 Treatability Study

- (a) If EPA requests, Respondents shall submit a TS Work Plan(s) (TSWP(s)) for EPA approval. Respondents shall prepare the TSWP in accordance with EPA's *Guide for Conducting Treatability Studies under CERCLA, Final* (Oct. 1992), as supplemented for RD by the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995).

- (b) Following completion of the TS, Respondents shall submit a TS Evaluation Report for EPA comment.
- (c) EPA may require Respondents to supplement the TS Evaluation Report and/or to perform additional treatability studies.

3.5 Preliminary (30%) RD. Respondents shall submit a Preliminary (30%) RD for EPA's comment. The Preliminary RD must include:

- (a) A design criteria report, as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995);
- (b) Preliminary drawings and specifications;
- (c) Descriptions of permit requirements, if applicable;
- (d) Preliminary Operation and Maintenance (O&M) Plan and O&M Manual;
- (e) A description of how the RA will be implemented in a manner that minimizes environmental impacts in accordance with EPA's *Principles for Greener Cleanups* (Aug. 2009) and EPA Region 2's Clean and Green Energy Policy (March 2009);
- (f) A description of monitoring and control measures to protect human health and the environment, such as air monitoring and dust suppression, during the RA;
- (g) An RA Schedule; and
- (h) Updates of all supporting deliverables required to accompany the RDWP described in Paragraph 3.2(j) and the following additional supporting deliverables described in Paragraph 5.7 (Supporting Deliverables): Quality Assurance Project Plan and Site Management Plan.

3.6 Intermediate (60%) RD. Respondents shall submit the Intermediate (60%) RD for EPA's comment. The Intermediate RD must: (a) be a continuation and expansion of the Preliminary RD; (b) address EPA's comments regarding the Preliminary RD; and (c) include the same elements as are required for the Preliminary (30%) RD.

3.7 Pre-Final (95%) RD. Respondents shall submit the Pre-final (95%) RD for EPA's comment. The Pre-final RD must be a continuation and expansion of the previous design submittal and must address EPA's comments regarding the Intermediate RD. The Pre-final RD will serve as the approved Final (100%) RD if EPA approves the Pre-final RD without comments. The Pre-final RD must include:

- (a) A complete set of construction drawings and specifications that are: (1) certified by a registered professional engineer licensed in the State of New York; (2) suitable for procurement; and (3) follow the Construction Specifications Institute's MasterFormat 2012;

- (b) A survey and engineering drawings showing existing features at OU1 of the Site, such as elements, property borders, easements, and conditions;
- (c) Pre-Final versions of the same elements and deliverables as are required for the Preliminary (30%) and Intermediate (60%) RD;
- (d) A specification for photographic documentation of the RA; and
- (e) Updates of all supporting deliverables required to accompany the RDWP and/or Preliminary (30%) RD, as applicable.

3.8 Final (100%) RD. Respondents shall submit the Final (100%) RD for EPA approval. The Final RD must address EPA's comments on the Pre-final RD and must include final versions of all Pre-final RD deliverables.

4. REPORTING

4.1 Progress Reports. Commencing with the first month following the Effective Date of the Order and until EPA provides Respondents written Notice of Completion of Work pursuant to Paragraph 82 of the Order. Respondents shall submit coordinated, combined, comprehensive and cohesive progress reports to EPA on a monthly basis, or as otherwise requested by EPA. The reports must cover all activities that took place during the prior reporting period, including:

- (a) The actions that have been taken toward achieving compliance with the Order;
- (b) A summary of all results of sampling, tests, and all other data received or generated by Respondents;
- (c) A description of all deliverables that Respondents submitted to EPA;
- (d) A description of any modifications to the work plans or other schedules that Respondents have proposed or that have been approved by EPA; and
- (e) A description of all activities undertaken in support of the Community Involvement Plan (CIP) during the reporting period and those to be undertaken in the next two months.

4.2 Notice of Progress Report Schedule Changes. If the schedule for any activity described in the Progress Reports, including activities required to be described under Paragraph 4.1(d), changes, Respondents shall notify EPA of such change at least 7 days before performance of the activity.

4.3 Emergency Response and Reporting

- (a) **Emergency Response and Reporting.** If any event occurs during performance of the Work that causes or threatens to cause a release of Waste Material on, at, or from OU1 of the Site and that either constitutes an emergency situation or that

- may present an immediate threat to public health or welfare or the environment, Respondents shall: (1) immediately take all appropriate action to prevent, abate, or minimize such release or threat of release; (2) immediately notify the authorized EPA officer (as specified in 4.3(c)) orally; and (3) take such actions in consultation with the authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plan, the Emergency Response Plan, and any other deliverable approved by EPA under this Amended SOW #1.
- (b) **Release Reporting.** Upon the occurrence of any event during performance of the Work that Respondents are required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004, Respondents shall immediately notify the authorized EPA officer orally.
 - (c) The "authorized EPA officer" for purposes of immediate oral notifications and consultations under Paragraph 4.3(a) and Paragraph 4.3(b) is the EPA Project Coordinator, Thomas Mongelli, at (212) 637-4256 or Mongelli.thomas@epa.gov, the Chief, Western New York Remediation Section, Pietro Mannino, (if the EPA Project Coordinator is unavailable) at (212) 637-4287 or Mannino.pietro@epa.gov, or the Chief, Removal Action Branch of the Emergency and Remedial Response Division, Joseph Rotola, EPA Region 2 at (732) 321-6658 or Rotola.joe@epa.gov (if neither the EPA Project Coordinator or Section Chief is available).
 - (d) For any event covered by Paragraph 4.3(a) and Paragraph 4.3(b), Respondents shall: (1) within 14 days after the onset of such event, submit a report to EPA describing the actions or events that occurred and the measures taken, and to be taken, in response thereto; and (2) within 30 days after the conclusion of such event, submit a report to EPA describing all actions taken in response to such event.
 - (e) The reporting requirements under Paragraph 4.3 are in addition to the reporting required by CERCLA § 103 or EPCRA § 304.

5. DELIVERABLES

- 5.1 **Applicability.** Respondents shall submit deliverables for EPA approval or for EPA comment as specified in this Amended SOW #1. If neither is specified, the deliverable does not require EPA's approval or comment. Paragraphs 5.2 (In Writing) through 5.4 (Technical Specifications) apply to all deliverables. Paragraph 5.5 (Certification) applies to any deliverable that is required to be certified. Paragraph 5.6 (Approval of Deliverables) applies to any deliverable that is required to be submitted for EPA approval.
- 5.2 **In Writing.** All deliverables under this Amended SOW #1 must be in writing unless otherwise specified.

5.3 General Requirements for Deliverables. All deliverables must be submitted by the deadlines in the RD Schedule, as applicable. Respondents shall submit all deliverables in electronic form and hard copy. Technical specifications for sampling and monitoring data and spatial data are addressed in Paragraph 5.4. All other deliverables shall be submitted to EPA in the electronic form specified by the EPA Project Manager. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5" by 11", Respondents shall also provide EPA with paper copies of such exhibits. All notices and deliverables shall be submitted to the following, unless otherwise specified by EPA's Project Manager:

1 hard copy and 1 electronic copy:

U.S. Environmental Protection Agency Region 2

290 Broadway, 20th Floor

New York, New York 10007

Attention: New Cassel/Hicksville Groundwater Contamination Superfund Site

Remedial Project Manager

212-637-4256

mongelli.thomas@epa.gov

1 electronic copy to:

New York/Caribbean Superfund Branch

Office of Regional Counsel

United States Environmental Protection Agency Region II

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Attention: Attorney for New Cassel/Hicksville Groundwater Contamination Site

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1 hard copy and 1 electronic copy to:

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5.4 Technical Specifications

- (a) Sampling and monitoring data should be submitted in standard Regional Electronic Data Deliverable (EDD) format which can be found at <http://earthsoft.com/products/edp/edp-format-for-epar2/>. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.
- (b) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (1) in the ESRI File Geodatabase format; and (2) as unprojected geographic coordinates in decimal degree format using North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) as the datum. If applicable, submissions should include the collection method(s). Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at <https://github.com/USEPA/EPA-Metadata-Editor-5>.
- (c) Each file must include an attribute name for each site unit or sub-unit submitted. Consult <https://www.epa.gov/geospatial/geospatial-policies-and-standards> for any further available guidance on attribute identification and naming.
- (d) Spatial data submitted by Respondents does not, and is not intended to, define the boundaries of OU1 of the Site.

5.5 Certification. All deliverables that require compliance with this Paragraph 5.5 must be signed by the Respondents' Project Coordinator, or other responsible official of Respondents, and must contain the following statement:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

5.6 Approval of Deliverables

- (a) **Initial Submissions**

- (1) After review of any deliverable that is required to be submitted for EPA approval under the Order or the Amended SOW #1, EPA shall:
 - (i) approve, in whole or in part, the submission; (ii) approve the submission upon specified conditions; (iii) disapprove, in whole or in part, the submission; or (iv) any combination of the foregoing.
 - (2) EPA also may modify the initial submission to cure deficiencies in the submission if: (i) EPA determines that disapproving the submission and awaiting a resubmission would cause substantial disruption to the Work; or (ii) previous submission(s) have been disapproved due to material defects and the deficiencies in the initial submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.
- (b) **Resubmissions.** Upon receipt of a notice of disapproval under Paragraph 5.6(a) (Initial Submissions), or if required by a notice of approval upon specified conditions under Paragraph 5.6(a), Respondents shall, within 21 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the deliverable for approval. After review of the resubmitted deliverable, EPA may: (1) approve, in whole or in part, the resubmission; (2) approve the resubmission upon specified conditions; (3) modify the resubmission; (4) disapprove, in whole or in part, the resubmission, requiring Respondents to correct the deficiencies; or (5) any combination of the foregoing.
- (c) **Implementation.** Upon approval, approval upon conditions, or modification by EPA under Paragraph 5.6(a) (Initial Submissions) or Paragraph 5.6(b) (Resubmissions), of any deliverable, or any portion thereof: (1) such deliverable, or portion thereof, will be incorporated into and enforceable under the Order; and (2) Respondents shall take any action required by such deliverable, or portion thereof.

5.7 Supporting Deliverables. Respondents shall submit each of the following supporting deliverables for EPA approval, except as specifically provided. Respondents shall develop the deliverables in accordance with all applicable regulations, guidance, and policies (see Section 8 (References)). Respondents shall update each of these supporting deliverables as necessary or appropriate during the course of the Work, and/or as requested by EPA.

- (a) **Health and Safety Plan.** The Health and Safety Plan (HASP) describes all activities to be performed to protect on site personnel and area residents from physical, chemical, and all other hazards posed by the Work. Respondents shall develop the HASP in accordance with EPA's Emergency Responder Health and Safety and Occupational Safety and Health Administration (OSHA) requirements under 29 C.F.R. §§ 1910 and 1926. The HASP should cover all RD activities. EPA does not approve the HASP, but will review it to ensure that all necessary elements are included and that the plan provides for the protection of human health and the environment.

- (b) **Emergency Response Plan.** The Emergency Response Plan (ERP) must describe procedures to be used in the event of an accident or emergency at OU1 of the Site (for example, power outages treatment plant failure, etc.). The ERP must include:
- (1) Name of the person or entity responsible for responding in the event of an emergency incident;
 - (2) Plan and date(s) for meeting(s) with the local community, including local, State, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals;
 - (3) Spill Prevention, Control, and Countermeasures (SPCC) Plan (if applicable), consistent with the regulations under 40 C.F.R. Part 112, describing measures to prevent, and contingency plans for, spills and discharges;
 - (4) Notification activities in accordance with Paragraph 4.3(b) (Release Reporting) in the event of a release of hazardous substances requiring reporting under Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004; and
 - (5) A description of all necessary actions to ensure compliance with Paragraph 4.3 in the event of an occurrence during the performance of the Work that causes or threatens a release of Waste Material from OU1 of the Site that constitutes an emergency or may present an immediate threat to public health or welfare or the environment.
- (c) **Field Sampling Plan.** The Field Sampling Plan (FSP) addresses all sample collection activities. The FSP must be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. Respondents shall develop the FSP in accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies*, EPA/540/G 89/004 (Oct. 1988).
- (d) **Quality Assurance Project Plan.** The Quality Assurance Project Plan (QAPP) augments the FSP and addresses sample analysis and data handling regarding the Work. The QAPP must include a detailed explanation of Respondents' quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. Respondents shall develop the QAPP in accordance with *EPA Requirements for Quality Assurance Project Plans*, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006); *Guidance for Quality Assurance Project Plans*, QA/G-5, EPA/240/R 02/009 (Dec. 2002); and *Uniform Federal Policy for Quality Assurance Project Plans*, Parts 1-3, EPA/505/B-04/900A through 900C (Mar. 2005). The QAPP also must include procedures:

- (1) To ensure that EPA and its authorized representative have reasonable access to laboratories used by Respondents in implementing the Work (Respondents' Labs);
 - (2) To ensure that Respondents' Labs analyze all samples submitted by EPA pursuant to the QAPP for quality assurance monitoring;
 - (3) To ensure that Respondents' Labs perform all analyses using EPA-accepted methods (i.e., the methods documented in *USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis*, ILM05.4 (Dec. 2006); *USEPA Contract Laboratory Program Statement of Work for Organic Analysis*, SOM01.2 (amended Apr. 2007); and *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)*, ISM01.2 (Jan. 2010)) or other methods acceptable to EPA;
 - (4) To ensure that Respondents' Labs participate in an EPA-accepted QA/QC program or other program QA/QC acceptable to EPA;
 - (5) For Respondents to provide EPA with notice at least 21 days prior to any sample collection activity;
 - (6) For Respondents to provide split samples and/or duplicate samples to EPA upon request;
 - (7) For EPA to take any additional samples that it deems necessary;
 - (8) For EPA to provide to Respondents, upon request, split samples and/or duplicate samples in connection with EPA's oversight sampling; and
 - (9) For Respondents to submit to EPA all sampling and tests results and other data in connection with the implementation of the Work.
- (e) **Site Management Plan.** The Site Management Plan (SMP) for OU1 shall include the following components associated with operation and maintenance for the remedy:
- (1) **Institutional Control Implementation Assurance Plan (ICIAP):** The ICIAP describes plans to implement, maintain, and enforce the Institutional Controls (ICs) at OU1 of the Site. SDs shall develop the ICIAP in accordance with *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012), and *Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites*, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012). The ICIAP must include the following additional requirements:

- (i) a description of the pathways for potential human exposure to hazardous substances that may remain during and/or after completion of construction of the remedial action;
 - (ii) a description of the proposed institutional controls and their purpose (i.e., letters to local government);
 - (iii) a description of the proposed duration of each institutional control and an explanation for such duration;
 - (iv) a schedule for implementing each institutional control;
 - (v) a plan for monitoring, maintaining, and reporting on, the continued efficacy of the institutional controls, and
 - (vi) a schedule for periodic certifications regarding whether the institutional controls remain in place, regarding whether the institutional controls have been complied with, and steps taken to address any problems with informational or governmental controls, as applicable;
- (2) **Transportation and Off-Site Disposal Plan.** The Transportation and Off-Site Disposal Plan (TODP) describes plans to ensure compliance with Paragraph 57 of the Order. The TODP must include:
- (i) Proposed routes for off-site shipment of Waste Material;
 - (ii) Identification of communities affected by shipment of Waste Material; and
 - (iii) Description of plans to minimize impacts on affected communities.
- (3) **Quality of Life Plan.** A Quality of Life Plan (QOLP) shall provide information related to measures that Respondents will implement to minimize the adverse effects to the community (e.g., noise, security, light pollution, hours of operation, etc.) resulting from the activities conducted pursuant to the OU1 PDI. The requirements of the QOLP shall be prepared consistent with federal, state, and local ordinances.
- (4) **Monitoring Plan:** The purpose of the Monitoring Plan (MP) is to obtain baseline information regarding the extent of contamination in affected media at OU1 of the Site; to obtain information, through short- and long-term monitoring, about the movement of and changes in contamination throughout OU1 of the Site, before and during implementation of the RA; to obtain information regarding contamination levels to determine whether performance standards are achieved; and to obtain information to determine whether to perform additional actions, including further monitoring. The MP must include:

- (i) Description of the environmental media to be monitored;
- (ii) Description of the data collection parameters, including existing and proposed monitoring devices and locations, schedule and frequency of monitoring, analytical parameters to be monitored, and analytical methods employed;
- (iii) Description of how performance data will be analyzed, interpreted, and reported, and/or other related requirements for OU1 of the Site;
- (iv) Description of verification sampling procedures;
- (v) Description of deliverables that will be generated in connection with monitoring, including sampling schedules, laboratory records, monitoring reports, and monthly and annual reports to EPA and State agencies; and
- (vi) Description of proposed additional monitoring and data collection actions (such as increases in frequency of monitoring, and/or installation of additional monitoring devices in the affected areas) in the event that results from monitoring devices indicate changed conditions (such as higher than expected concentrations of the contaminants of concern or groundwater contaminant plume movement).

6. SCHEDULES

6.1 Applicability and Revisions. All deliverables and tasks required under this Amended SOW #1 must be submitted or completed by the deadlines or within the time durations listed in the RD Schedule set forth below. Respondents may submit proposed revised RD Schedules for EPA approval. Upon EPA's approval, the revised RD Schedule supersede the RD Schedule set forth below, and any previously-approved RD Schedule.

6.2 RD Schedule.

	Description of Deliverable, Activity	Amended SOW #1 Section Ref.	Deadline	Responsible Respondent Group
1	Designation of Project Coordinator and Contractor(s)	Paragraph 53 of the Order	October 1, 2018	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups for Project Coordinator Eastern Plume Group, Central Plume Group, and Western Plume Group for Supervising Contractor(s)
2	Progress Reports	4.1	15th day of each month following EPA approval of Project Coordinator	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups
Supporting Deliverables				
3	Quality Assurance Project Plan (QAPP)	5.7(d)	60 days after EPA's approval of the Project Coordinator under Section X of the Order	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups
4	QAPP Addendum(s)	5.7(d)	30 days after EPA's authorization to proceed with relevant PDI Directive	Eastern Plume Group Central Plume Group Western Plume Group
5	Health and Safety Plan (HASP)	5.7(a)	60 days after EPA's approval of the Project Coordinator under Section X of the Order	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups

6	Site Management Plan	5.7(e)	60 days after EPA's approval of the Project Coordinator under Section X of the Order	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups
7	Emergency Response Plan (ERP)	5.7(b)	60 days after EPA's approval of the Project Coordinator under Section X of the Order	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups
8	Field Sampling Plan	5.7(c)	60 days after written notification of the start of PDI Directive 1 Round 1 Field Work	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups
PDI Investigation (PDI)				
PDI Directive 1 Round 1		3.1.b(1)(i)		Eastern Plume Group, Central Plume Group, Western Plume Group. If Western Plume Group fails to comply then EPA
9	PDI Directive 1 Technical Memorandum	3.1.b(1)(i)(D)		If Western Plume Group fails to comply then EPA
PDI Directive 1 Round 2		3.1.b(1)(ii)		Eastern Plume Group, Central Plume Group, Western Plume Group. If Western Plume Group fails to comply then EPA
10	PDI Directive 1 Technical Memorandum Addendum	3.1.b(1)(ii)(E)		Common Work Element. If Western Plume Group fails to comply then EPA

PDI Directive 2		3.1.b(2)		Eastern Plume Group Central Plume Group Western Plume Group
11	PDI Directive 2 Technical Memorandum	3.1.b(2)(iv)	12 months after EPA's authorization to proceed with PDI Directive 2	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups for Eastern and Central Plumes
12	PDI Recommendations Report	3.1.b(2)(v)	30 days after Respondent's submission of the PDI Directive 2 Technical Memorandum	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups for Eastern and Central Plumes
13	Respondent's in-person PDI Recommendations Report presentation	3.1.b(2)(vi)	30 days after Respondent's submission of the PDI Recommendations Report	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups for Eastern and Central Plumes.
PDI Directive 3		3.1.b(3)		Eastern Plume Group and Western Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 4.

Aquifer Test Option 1, Aquifer Test Option 2, or Aquifer Test Option 3		3.1.b(3)(i)		Eastern Plume Group and Western Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 4.
14	Aquifer Test Technical Memorandum 1, 2, or 3 (depending on which aquifer test option is evaluated)	3.1.b(3)(ii)	<p>Option 1 or 2: 45 days after EPA's authorization to proceed with PDI Directive 3</p> <p>Option 3: 150 days after EPA's authorization to proceed with PDI Directive 3</p>	Eastern Plume Group and Western Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 4.
Effluent Discharge Evaluation Option 1, Option 2, Option 3, or Option 4		3.1.b(3)(i)		Eastern Plume Group and Western Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 4.

15	Effluent Discharge Evaluation Option Technical Memorandum	3.1.b(3)(ii)	<p>Option 1: 45 days after EPA's authorization to proceed with PDI Directive 3</p> <p>Option 2: 90 days after EPA approval of QAPP amendment</p> <p>Option 3: 150 days after EPA's authorization to proceed</p> <p>Option 4: 45 days after EPA's authorization to proceed</p>	<p>Eastern Plume Group and Western Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 4.</p>
16	PDI Directive 3 Technical Memorandum	3.1.b(3)(iv)	5 months after EPA's authorization to proceed following PDI Recommendations Report	<p>Eastern Plume Group and Western Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 4.</p>
17	PDI Work Plan (PDIWP) Amendment - Directive 3	3.1.b(3)(iii)	30 days after EPA's authorization to proceed	<p>Central Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 4.</p>

18	Addendum to PDI Directive 3 Technical Memorandum	3.1.b(3)(iv)	5 months after EPA's authorization to proceed	Central Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 4.
	PDI Directive 4	3.1.b(4)		Central Plume Group and Western Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Eastern Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 3.
	Pilot Test(s)	3.1.b(4)		Central Plume Group and Western Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Eastern Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 3.
19	Pilot Test Status Report(s)	3.1.b(4)	To be submitted monthly for each pilot test	Central Plume Group and Western Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Eastern Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 3.

20	PDI Directive 4 Technical Memorandum	3.1.b(4)(ii)	11 months after EPA's approval of the QAPP amendment or after EPA's authorization to proceed if a QAPP amendment is not submitted	Central Plume Group and Western Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Eastern Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 3.
21	PDIWP Amendment - Directive 4	3.1.b(4)(iii)	30 days after EPA's authorization to proceed	Eastern Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 3.
22	Addendum to PDI Directive 4 Technical Memorandum	3.1.b(4)(iv)	5 months after EPA's authorization to proceed	Eastern Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report, presentation, and/or work related to PDI Directive 3.
PDI Directive 5		3.1.b(5)		Eastern Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group and Western Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report and presentation.

	ISCO Target Zone Delineation	3.1.b(5)		Eastern Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group and Western Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report and presentation.
23	ISCO Target Zone Delineation Technical Memorandum	3.1.b(5)	6 months after EPA's authorization to proceed	Eastern Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group and Western Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report and presentation.
	Bench Scale Testing	3.1.b(5)		Eastern Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group and Western Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report and presentation.
24	ISCO Bench Scale Testing Technical Memorandum	3.1.b(5)	120 days after EPA's authorization to proceed	Eastern Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group and Western Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report and presentation.

25	ISCO Pilot Test Work Plan	3.1.b(5)	120 days after EPA's authorization to proceed. Deliverable will be submitted concurrently with ISCO Bench Scale Testing Technical Memorandum	Eastern Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group and Western Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report and presentation.
ISCO Pilot Test		3.1.b(5)		Eastern Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group and Western Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report and presentation.
26	PDI Directive 5 Technical Memorandum	3.1.b(5)(ii)	6 months after EPA's approval of the ISCO Bench Scale Testing Technical Memorandum or EPA's authorization to proceed	Eastern Plume Group, unless otherwise determined by EPA based on Respondent's PDI Recommendation Report and presentation. Central Plume Group and Western Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report and presentation.
27	PDIWP Amendment - Directive 5	3.1.b(5)(iii)	30 days after EPA's authorization to proceed	Central Plume Group, and Western Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report and presentation.

28	Addendum to PDI Directive 5 Technical Memorandum	3.1.b(5)(iv)	6 months after EPA's authorization to proceed	Central Plume Group and Western Plume Group, if determined by EPA based on Respondent's PDI Recommendations Report and presentation.
29	RD Recommendations Report	3.1.b(6)	30 days after Respondent's submission of the latter of PDI Directive 3 Technical Memorandum, PDI Directive 4 Technical Memorandum, and PDI Directive 5 Technical Memorandum, or unless otherwise directed by EPA.	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups
30	Respondent's in-person RD Recommendations Report presentation	3.1.b(6)	15 days after Respondent's submission of the RD Recommendations Report	Common Work Element. If Western Plume Group fails to comply then combined Eastern and Central Plume Groups
31	Remedial Design Work Plan (RDWP)	3.2	45 days after EPA approval of the RD Recommendations Report	Common Work Element. If Western Plume Group fails to comply, then as determined by EPA based on data and Plume Group recommendation.
32	Treatability Study Work Plan	3.4	45 days after EPA approval of RDWP, if determined necessary by EPA	As determined by EPA based on data and Plume Group recommendation.
33	Preliminary (30%) RD	3.5	90 days after EPA approval of RDWP	Common Work Element. If Western Plume Group fails to comply, then as determined by EPA based on data and Plume Group recommendation.

34	Intermediate (60%) RD	3.6	90 days after receipt of EPA comments on Preliminary RD	Common Work Element. If Western Plume Group fails to comply, then as determined by EPA based on data and Plume Group recommendation.
35	Pre-final (95%) RD	3.7	90 days after receipt of EPA comments on Intermediate RD	Common Work Element. If Western Plume Group fails to comply, then as determined by EPA based on data and Plume Group recommendation.
36	Final (100%) RD	3.8	30 days after EPA comments on Pre-final RD	Common Work Element. If Western Plume Group fails to comply, then as determined by EPA based on data and Plume Group recommendation.

7. STATE PARTICIPATION

- 7.1 Copies.** Respondents shall, at any time they send a deliverable to EPA, send a copy of such deliverable to the State. EPA shall, at any time it sends a notice, authorization, approval, disapproval, or certification to Respondents, send a copy of such document to the State.
- 7.2 Review and Comment.** The State will have a reasonable opportunity for review and comment prior to:
- (a) Any EPA approval or disapproval under Paragraph 5.6 (Approval of Deliverables) of any deliverables that are required to be submitted for EPA approval; and
 - (b) Any Notice of Completion of Work under Paragraph 82 of the Order.

8. REFERENCES

- 8.1** The following regulations and guidance documents, among others, apply to the Work. Any item for which a specific URL is not provided below is available on one of the two EPA Web pages listed in Paragraph 8.2:
- (a) A Compendium of Superfund Field Operations Methods, OSWER 9355.0-14, EPA/540/P-87/001a (Aug. 1987).

- (b) CERCLA Compliance with Other Laws Manual, Part I: Interim Final, OSWER 9234.1-01, EPA/540/G-89/006 (Aug. 1988).
- (c) Guidance for Conducting Remedial Investigations and Feasibility Studies, OSWER 9355.3-01, EPA/540/G-89/004 (Oct. 1988).
- (d) CERCLA Compliance with Other Laws Manual, Part II, OSWER 9234.1-02, EPA/540/G-89/009 (Aug. 1989).
- (e) Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, OSWER 9355.5-01, EPA/540/G-90/001 (Apr. 1990).
- (f) Guidance on Expediting Remedial Design and Remedial Actions, OSWER 9355.5-02, EPA/540/G-90/006 (Aug. 1990).
- (g) Guide to Management of Investigation-Derived Wastes, OSWER 9345.3-03FS (Jan. 1992).
- (h) Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, OSWER 9355.7-03 (Feb. 1992).
- (i) Guidance for Conducting Treatability Studies under CERCLA, OSWER 9380.3-10, EPA/540/R-92/071A (Nov. 1992).
- (j) National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 40 C.F.R. Part 300 (Oct. 1994).
- (k) Guidance for Scoping the Remedial Design, OSWER 9355.0-43, EPA/540/R-95/025 (Mar. 1995).
- (l) Remedial Design/Remedial Action Handbook, OSWER 9355.0-04B, EPA/540/R-95/059 (June 1995).
- (m) EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis, QA/G-9, EPA/600/R-96/084 (July 2000).
- (n) Operation and Maintenance in the Superfund Program, OSWER 9200.1-37FS, EPA/540/F-01/004 (May 2001).
- (o) Comprehensive Five-year Review Guidance, OSWER 9355.7-03B-P, 540-R-01-007 (June 2001).
- (p) Guidance for Quality Assurance Project Plans, QA/G-5, EPA/240/R-02/009 (Dec. 2002).
- (q) Institutional Controls: Third Party Beneficiary Rights in Proprietary Controls (Apr. 2004).

- (r) Quality management systems for environmental information and technology programs - Requirements with guidance for use, ASQ/ANSI E4:2014 (American Society for Quality, February 2014).
- (s) Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3, EPA/505/B-04/900A through 900C (Mar. 2005).
- (t) Superfund Community Involvement Handbook, EPA/540/K-05/003 (Apr. 2005).
- (u) EPA Guidance on Systematic Planning Using the Data Quality Objectives Process, QA/G-4, EPA/240/B-06/001 (Feb. 2006).
- (v) EPA Requirements for Quality Assurance Project Plans, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006).
- (w) EPA Requirements for Quality Management Plans, QA/R-2, EPA/240/B-01/002 (Mar. 2001, reissued May 2006).
- (x) USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, ILM05.4 (Dec. 2006).
- (y) USEPA Contract Laboratory Program Statement of Work for Organic Analysis, SOM01.2 (amended Apr. 2007).
- (z) EPA National Geospatial Data Policy, CIO Policy Transmittal 05-002 (Aug. 2008), available at <https://www.epa.gov/geospatial/epa-national-geospatial-data-policy>.
- (aa) Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, OSWER 9283.1-33 (June 2009).
- (bb) Principles for Greener Cleanups (Aug. 2009), available at <https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups>, and Region 2's Clean and Green Energy Policy, available at <https://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy>.
- (cc) USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration), ISM01.2 (Jan. 2010).
- (dd) Close Out Procedures for National Priorities List Sites, OSWER 9320.2-22 (May 2011).
- (ee) Groundwater Road Map: Recommended Process for Restoring Contaminated Groundwater at Superfund Sites, OSWER 9283.1-34 (July 2011).
- (ff) Recommended Evaluation of Institutional Controls: Supplement to the "Comprehensive Five-Year Review Guidance," OSWER 9355.7-18 (Sep. 2011).

- (gg) Construction Specifications Institute's MasterFormat 2016, available from the Construction Specifications Institute, <https://www.csiresources.org/practice/standards/masterformat>.
- (hh) Updated Superfund Response and Settlement Approach for Sites Using the Superfund Alternative Approach, OSWER 9200.2-125 (Sep. 2012)
- (ii) Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012).
- (jj) Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012).
- (kk) EPA's Emergency Responder Health and Safety Manual, OSWER 9285.3-12 (July 2005 and updates), http://www.epaossc.org/_HealthSafetyManual/manual-index.htm
- (ll) Broader Application of Remedial Design and Remedial Action Pilot Project Lessons Learned, OSWER 9200.2-129 (Feb. 2013).
- (mm) Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions, OSWER 9355.0-129 (Nov. 2013).
- (nn) Groundwater Remedy Completion Strategy: Moving Forward with the End in Mind, OSWER 9200.2-144 (May 2014).

8.2 A more complete list may be found on the following EPA Web pages:

Laws, Policy, and Guidance <https://www.epa.gov/superfund/superfund-policy-guidance-and-laws>.

Test Methods Collections <https://www.epa.gov/measurements/collection-methods>

8.3 For any regulation or guidance referenced in the Order or this Amended SOW #1, the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance. Such modifications, amendments, or replacements apply to the Work only after Respondents receive notification from EPA of the modification, amendment, or replacement.

